

CLAIMS

1. A method of making silver chain which comprises forming lengths of silver
5 wire into successive chain links whose ends abut, and closing the links by brazing or
welding abutting ends thereof by means of a laser, wherein the wire comprises at
least 92.5 wt % Ag and about 0.5 - about 3 wt % Ge.
2. The method of claim 1, wherein the wire is of diameter 0.008 - 0.20 cm
10 (0.003-0.08 inches).
3. The method of claim 1, wherein the wire is of diameter 0.013-0.08 cm
(0.005-0.030 inches).
- 15 4. The method of any preceding claim, wherein the composition of the wire in
cross section is constant.
5. The method of claim 4, wherein the wire is of a ternary Ag-Cu-Ge alloy
containing at least 92.5 wt% Ag, 0.5-3 wt% Ge, elemental boron as a grain refiner at
20 a concentration of 1-40 ppm and the balance, apart from incidental ingredients and/or
impurities, copper.
6. The method of claim 4, wherein the wire is of a ternary Ag-Cu-Ge alloy
comprising, apart from incidental ingredients and impurities, not less than 92.5 wt%
25 Ag, about 6.3 wt % Cu, about 1.2 wt % Ge, and about 4-8 ppm elemental B.
7. The method of claim 4, wherein the wire is of a ternary Ag-Cu-Ge alloy
containing more than 93.5 wt% to 95.5 wt% Ag, from 0.5 to 3 wt% Ge, 1-40 ppm
elemental boron and the remainder, apart from incidental ingredients and/or
30 impurities, copper.

8. The method of claim 4, wherein the wire is of a ternary Ag-Cu-Ge alloy containing about 94.5 wt% Ag, 1.2 wt% Ge, 4-8 ppm elemental boron and the remainder, apart from incidental ingredients and/or impurities, copper.

5 9. The method of any of claims 1-3, wherein the silver wire has a solder or brazing alloy core.

10 10. The method of claim 9, wherein the non-core regions of the wire comprise 0.5-3 wt % Ge, the balance apart from incidental ingredients and/or impurities being silver.

11. The method of claim 10, wherein the non-core regions of the wire comprise about 1 wt% Ge.

15 12. The method of claim 9, 10 or 11, wherein the core is of a silver brazing alloy.

13. The method of claim 12, wherein said brazing alloy is of the Ag-Cu-Zn family containing at least 55 wt % Ag and from 0.5 to 3 wt % Ge.

20 14. The method of claim 11 or 12, wherein said alloy further comprises 0.1-0.3 wt % boron.

25 15. The method of any of claims 9-13, wherein said brazing alloy core has a solidus temperature of about 600°C to about 705°C and a liquidus temperature of about 650°C to about 725°C.

30 16. The method of claim 15, wherein said brazing alloy has a solidus temperature of about 600°C to about 630°C and a liquidus temperature of about 650°C to about 680°C.

17. The method of any preceding claim, wherein the links are closed at a rate of 100-250 links per minute.

18. The method of any preceding claim, wherein the links are closed using a laser of power 20-80W.

5 19. The method of any preceding claim, wherein the links are closed using a laser of power about 30W.

20. The method of any preceding claim, wherein the wire, prior to welding into said chain, has been annealed in an oxidizing atmosphere.

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21. The method of claim 20, wherein the oxidising atmosphere is air.

22. The method of claim 20, wherein the oxidising atmosphere is a selectively oxidising atmosphere.

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23. The method of claim 22, wherein the selectively oxidising atmosphere is a wet selectively oxidising atmosphere.

24. The method of claim 23, wherein the wet selectively oxidising atmosphere
20 comprises any of:

(a) hydrogen gas and moisture;

(b) carbon monoxide and carbon dioxide;

(c) nitrogen, hydrogen, carbon monoxide, carbon dioxide, methane, and moisture;

25 (d) argon or nitrogen, and oxygen.

25. The method of claim 23 or 24, wherein the atmosphere has a dew point of at least +1°C.

30 26. The method of claim 25, wherein the atmosphere has a dew point in the range from +1°C to +80°C.

27. The method of claim 25, wherein the atmosphere has a dew point in the range from +2°C to +50°C.
- 5 28. A silver chain which comprises lengths of silver wire formed into successive links whose ends abut and are closed by brazed or welded joints, wherein the wire comprises at least 92.5 wt% Ag and about 0.5- about 3 wt % Ge.